

CLAIMS

1. A linear motor device, comprising:
an inner yoke (30);
5 an outer yoke (4) located outside said inner yoke (30);
a coil-wound body (8) and a movable magnet portion (32) for driving a piston (43) reciprocating in a cylinder (42), both located between said inner yoke (30) and said outer yoke (4);
first and second clamping members (2, 3) for clamping said outer yoke (4); and
10 a spacer (5) for coupling said first and second clamping members (2, 3) at a given spacing,
said first clamping member (2) being provided with a support portion (16) supporting a spring (46) for pushing said piston (43), and
said second clamping member (3) being fixed directly or indirectly to said
15 cylinder (42).
2. The linear motor device according to claim 1, wherein
said spacer (5) has axial end faces and smaller-diameter portions (9a, 9b) protruding from said axial end faces at both ends, and
20 said first and second clamping members (2, 3) have first and second receiving portions (6a, 6b) having concave portions (10a-10d) for receiving the smaller-diameter portions (9a, 9b) of said spacer (5) and support surfaces for supporting said axial end faces of said spacer (5).
3. The linear motor device according to claim 1, wherein
25 said outer yoke (4) is made of a plurality of outer yoke blocks (4a, 4b) arranged in a circumferential direction of said first and second clamping members (2, 3), the outer yoke blocks being separated in a longitudinal direction of said spacer (5), and

said outer yoke blocks (4a, 4b) are bonded to said first and second clamping members (2, 3) with welded portions interposed therebetween.

5 4. A method for manufacturing a linear motor device, comprising the steps of:
fixing a first outer yoke block (4a) and a second outer yoke block (4b) to a first clamping member (2) and a second clamping member (3), respectively, by ultrasonic welding;

while said first and second outer yoke blocks (4a, 4b) are fixed to said first and second clamping members (2, 3), coupling said first and second clamping members (2, 3) together by ultrasonic welding with a spacer (5) interposed therebetween,;
10 fixing said first and second outer yoke blocks (4a, 4b) to each other.

5. The method of manufacturing a linear motor device according to claim 4, wherein said first and second clamping members (2, 3) are coupled together with a gap
15 provided between said first and second outer yoke blocks (4a, 4b).

6. A linear compressor comprising the linear motor device recited in claim 1.

20 7. A linear compressor, comprising:
a cylinder (42) provided in a casing (41);
a piston (43) reciprocating in said cylinder (42);
a linear motor device (1) provided in an outer periphery of said cylinder (42) to drive said piston (43); and
a spring (46) for pushing said piston (43),
25 said linear motor device (1) having an inner yoke (30), an outer yoke (4) located outside said inner yoke (30), a coil-wound body (8) and a movable magnet portion (32) located between said inner yoke (30) and said outer yoke (4), first and second clamping members (2, 3) for clamping said outer yoke (4), a spacer (5) for coupling said first and

second clamping members (2, 3) at a given spacing, and a support portion (16) for supporting said spring (46),

said first clamping member (2) being provided with said support portion (16),
and

5 said second clamping member (3) being mounted to said cylinder (42).

8. A Stirling engine, comprising:

a cylinder (22) provided in a casing (21);

a piston (23) and a displacer (24) reciprocating in said cylinder (22);

10 a linear motor device (1) provided in an outer periphery of said cylinder (22) for allowing said piston (23) to reciprocate in said cylinder (22); and

a spring (34) for pushing the displacer (24),

15 said linear motor device (1) having an inner yoke (30), an outer yoke (4) located outside said inner yoke (30), a coil-wound body (8) and a movable magnet portion (32) located between said inner yoke (30) and said outer yoke (4), first and second clamping members (2, 3) for clamping said outer yoke (4), a spacer (5) for coupling said first and second clamping members (2, 3) at a given spacing, and a support portion (16) for supporting said spring (34),

20 said first clamping member (2) being provided with said support portion (16),
and

said second clamping member (3) being mounted to said cylinder (22).